

Attorney Docket No.: 5618.520-US

PATENT

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of: Svendsen et al.

Confirmation No: 2614

Serial No.: 10/734,510

Group Art Unit: 1652

Filed: December 12, 2003

Examiner: T. Saidha

For: Phytase Variants

**REPLY BRIEF UNDER 37 C.F.R. 41.39 and 41.41**

Mail Stop Appeal Brief - Patents  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

Applicants submit this reply brief to the Examiner's Answer mailed March 29, 2007.

## **I. ISSUES**

The Examiner's Answer withdrew the rejection under the judicially created doctrine of obviousness-type double patenting over claims 1-3 of Lassen et al. (U.S. Patent No. 6,060,298), but maintained the rejection of claim 121 as anticipated under 35 U.S.C. 102(e) by Lassen et al.

The Examiner's Answer also made a new ground of rejection, namely, that claim 121 is unpatentable under 35 U.S.C. 112 as being indefinite.

## II. ARGUMENT

### A. Claim 121 Is Not Anticipated Under 35 U.S.C. 102(e) by Lassen et al. (U.S. Patent No. 6,060,298)

The Office misinterprets the claims in the Examiner's Answer and continues to ignore limitations in claim 105 (from which claim 121 depends) and claim 121. In the first three paragraphs on page 9, the Examiner's Answer states:

As may be noted claim 105 is a broad claim drawn to 'method of making modified phytase by mutating one or more positions selected from the group consisting of 71, 72, 73, 74, 75, 76, 77, 78, 81, 82, 84, 116, 117, 119, and 120 with respect to SEQ ID NO: 7 are modified by another amino acid. Appellants also acknowledge that a substitution is a change of an amino acid with a different amino acid.

The unmodified sequence of SEQ ID NO: 7 at the specific positions are the same, viz., W75, S78 and Q84.

However, this is not the case in claim 121, wherein the claimed method depends from a broader claim 105, now substitutes a tryptophan for another tryptophan (W75W); or a serine for another serine (S78S); or a Glutamine for another Glutamine (Q84Q (Gln); and such a substitution is equal to no substitution at all. The claimed method of claim 121, reverts back to "a method making the unmodified phytase or wild-type phytase (at least with respect to the sequence of SEQ ID NO: 7)," and is therefore not a method of making a modified phytase as no amino acid is altered or substituted with a different amino acid at these positions, and therefore taught by Lassen et al. (U.S. Patent 6,060,298).

As explained in Applicants' Appeal Brief filed January 17, 2007, claim 121 is directed to methods of producing a modified phytase by introducing a mutation in the amino acid sequence of a parent phytase, e.g., the phytase of SEQ ID NO: 7. Applicants' specification defines a mutation as an alteration to the amino acid sequence by the introduction of an insertion, deletion or substitution. Thus, a modified phytase has a different amino acid sequence relative to the parent phytase from which it is derived. In order to determine if a substitution has been introduced, one compares the amino acid sequence of the parent phytase and the amino acid sequence of the modified phytase. If the two enzymes have the same amino acid at a position, a mutation has not been introduced at that position.

This interpretation is consistent with the specification. The specification discloses numerous examples of modified phytases comprising a substitution. See, e.g., pages 39-44 of the specification. All of these modified phytases have a substitution of one amino acid with a different amino acid. For example, with respect to position 75, the specification at page 39, line 34 discloses a modified *Paxillus* phytase comprising a substitution of F75W, i.e., the substitution of a phenylalanine residue with a tryptophan residue. Obviously, if a wild-type phytase has a

tryptophan residue at position 75, then claim 121 covers the substitution of the tryptophan residue to a phenylalanine residue. However, claim 121 does not cover the wild-type phytase comprising a tryptophan residue at position 75 because it is already there and not substituted.

The Examiner's Answer also stated that, "Several telephone attempts were made during the prosecution of this application ... and Appellants were invited to amend the claim(s) to place them in condition for allowance. However, an agreement could not be reached."

The amendment proposed by the Office to place claim 121 in condition for allowance would have required Appellants to delete 75W, 78S and 85Q from the list of recited mutations. Such an amendment could have created an argument that Appellants were estopped from arguing that claim 105 (the claim from which claim 121 depends) covered these substitutions.

For the foregoing reasons and the reasons set forth in Appellants' Appeal Brief, claim 121 is novel over Lassen et al. and respectfully request reversal of this rejection.

#### **B. Claim 121 Complies With the Definiteness Requirement**

Claim 121 is rejected under 35 U.S.C. 112 as being indefinite for failing to particularly point out and distinctly claim the subject matter which Appellant regards as the invention. This rejection is a new ground for rejection. In the Examiner's Answer, the Office states:

Claim 121 depends on claim 105. Claim 105 is drawn to 'a method of producing a modified phytase, comprising introducing a mutation in an amino acid sequence of a phytase, wherein the modified phytase has phytase activity and the mutation is at one or more positions selected from the group consisting of 71, 72, 73, 74, 75, 76, 77, 78, 81, 82, 84, 116, 117, 119, and 120, wherein each position corresponds to the amino acid sequence of mature *P. lycii* phytase (SEQ ID NO: 7).'

Claim 121 (depends on claim 105), is drawn to 'a method of producing a modified phytase and recites the following specific substitutions 75W (Trp), 78S (Ser) and 84Q (Gln) corresponding to SEQ ID NO: 7. Wild-type phytase sequence of SEQ ID NO: 7 already has a tryptophan ... at position 75, a serine ... at position 78, and Glutamine ... at position 84.

Therefore, substitution of a tryptophan for another tryptophan (W75W); or substitution of a serine for another serine (S78S); or substitution of a Glutamine for another Glutamine Q84Q (Gln), in claim 121, is equal to no substitution.

As explained above, claim 121 is directed to methods of producing a modified phytase by introducing a mutation in the amino acid sequence of a parent phytase, e.g., the phytase of SEQ ID NO: 7. Applicants' specification defines a mutation as an alteration to the amino acid sequence by the introduction of an insertion, deletion or substitution. Thus, a modified phytase has a different amino acid sequence relative to the parent phytase from which it is derived. In order to determine if a substitution has been introduced, one compares the amino acid sequence of the

parent phytase and the amino acid sequence of the modified phytase. If the two enzymes have the same amino acid at a position, a mutation has not been introduced at that position.

This interpretation is consistent with the specification. The specification discloses numerous examples of modified phytases comprising a substitution. See, e.g., pages 39-44 of the specification. All of these modified phytases have a substitution of one amino acid with a different amino acid. For example, with respect to position 75, the specification at page 39, line 34 discloses a modified *Paxillus* phytase comprising a substitution of F75W, i.e., the substitution of a phenylalanine residue with a tryptophan residue. Obviously, if a wild-type phytase has a tryptophan residue at position 75, then claim 121 covers the substitution of the tryptophan residue to a phenylalanine residue. However, claim 121 does not cover the wild-type phytase comprising a tryptophan residue at position 75 because it is already there and not substituted.

For the foregoing reasons, Applicants submit that claim 121 is patentable under 35 U.S.C. 112. Applicants respectfully request reversal of this rejection.

### III. CONCLUSION

For the foregoing reasons, Applicants submit that claim 121 is patentable under 35 U.S.C. 102 and 35 U.S.C. 112. Accordingly, the final rejection of the claims should be reversed.

Respectfully submitted,

Date: May 29, 2007

/Elias Lambiris, Reg. # 33728/  
Elias J. Lambiris, Reg. No. 33,728  
Novozymes North America, Inc.  
500 Fifth Avenue, Suite 1600  
New York, NY 10110  
(212) 840-0097